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Measurement of the $^{208}\text{Pb}(^{55}\text{Mn}, n)^{262}\text{Bh}$ Excitation Function

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The excitation function for the $^{208}\text{Pb}(^{55}\text{Mn}, n)^{262}\text{Bh}$ reaction has been measured for the first time. Using the Berkeley Gas-filled Separator at the Lawrence Berkeley National Laboratory 88-Inch Cyclotron, a total of 33 decay chains attributable to ^{262}Bh were observed at three different projectile energies. The existence of a previously reported alpha-decaying isomeric state was confirmed, although the production of the ground state was favored at all three energies. Additionally, 2 decay chains attributable to ^{261}Bh were observed. The observed cross sections are much larger than those reported for the analogous $^{209}\text{Bi}(^{54}\text{Cr}, n)^{262}\text{Bh}$ reaction, suggesting that in the latter case the projectile energies used were too high for optimum production of the $1n$ product. These results will be compared with predictions for the location of the excitation function maximum and the maximum cross section using the “Fusion by Diffusion” theory proposed by Swiatecki, Siwek-Wilczynska, and Wilczynski.

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